

What is claimed is:

- 1        1.    An apparatus comprising:  
2            a threshold detector having a current comparator to  
3 determine if an input signal exceeds a threshold.
  
- 1        2.    The apparatus of claim 1, wherein the threshold  
2 detector comprises a differential amplifier stage having an  
3 input stage comprising a first transistor and a second  
4 transistor having collectors and emitters coupled together.
  
- 1        3.    The apparatus of claim 2, wherein the  
2 differential amplifier stage has a reference stage having a  
3 third transistor and a fourth transistor, the third and  
4 fourth transistors having emitters coupled to the emitters  
5 of the first and second transmitters.
  
- 1        4.    The apparatus of claim 3, wherein the reference  
2 stage is coupled to receive a voltage reference from a half  
3 differential amplifier stage.
  
- 1        5.    The apparatus of claim 4, further comprising a  
2 current source to bias the reference stage and a limiting  
3 amplifier coupled to the threshold detector.

1        6.    The apparatus of claim 1, wherein the threshold  
2 detector is coupled to detect a loss of a received signal  
3 input into a limiting amplifier.

1        7.    The apparatus of claim 6, wherein the received  
2 signal is derived from a high frequency optical signal.

1        8.    The apparatus of claim 6, wherein the threshold  
2 detector is coupled to detect an absolute value of a  
3 differential stage output of the limiting amplifier.

1        9.    The apparatus of claim 2, further comprising  
2 cross-coupled transistors coupled between the input stage  
3 and a resistor load to provide a feedback gain to the input  
4 stage.

1        10.   An apparatus comprising:  
2        a first Schmitt trigger having an output coupled to an  
3 input of a second Schmitt trigger to generate hysteresis.

1        11.   The apparatus of claim 10, wherein the first  
2 Schmitt trigger includes a first differential amplifier  
3 having an inverting input coupled to receive an input  
4 signal and a non-inverting input coupled to receive an  
5 output of the second Schmitt trigger.

1        12. The apparatus of claim 11, wherein the second  
2 Schmitt trigger comprises a second differential amplifier  
3 having an inverting input coupled to receive an output of  
4 the first differential amplifier.

1        13. The apparatus of claim 10, further comprising a  
2 first voltage divider coupled to the output of the first  
3 Schmitt trigger.

1        14. The apparatus of claim 13, wherein the input of  
2 the second Schmitt trigger is coupled to a node between a  
3 first resistor and a second resistor of the first voltage  
4 divider.

1        15. The apparatus of claim 10, wherein the output of  
2 the first Schmitt trigger is a fixed percentage of an input  
3 signal of the first Schmitt trigger.

1        16. The apparatus of claim 10, wherein the output of  
2 the first Schmitt trigger is based upon a threshold level  
3 for a loss of received signal of an optical communication  
4 system.

1        17. A method comprising:  
2        determining an absolute value of a differential input;  
3        and

4        comparing the absolute value to a reference signal  
5        using a current comparator.

1        18. The method of claim 17, further comprising  
2        providing a common mode direct current feedback signal to a  
3        current source.

1        19. The method of claim 17, further comprising  
2        providing an output of the current comparator that is  
3        indicative of a loss of received signal of an optical  
4        communication system.

1        20. The method of claim 17, further comprising  
2        receiving the differential input from a limiting amplifier.

1        21. A system comprising:  
2        a threshold detector having a current comparator to  
3        determine if a signal representing an incoming optical  
4        signal exceeds a threshold; and  
5        an optical fiber coupled to provide the incoming  
6        optical signal.

1        22. The system of claim 21, further comprising a  
2        limiting amplifier coupled between the optical fiber and  
3        the threshold detector.

1        23. The system of claim 22, wherein the threshold  
2 detector is coupled to detect an absolute value of a  
3 differential stage output of the limiting amplifier.

1        24. The system of claim 21, wherein the threshold  
2 detector comprises an input stage and a reference stage,  
3 the input stage and the reference stage comprising a  
4 plurality of transistors having emitters coupled together.

1        25. The system of claim 24, further comprising a  
2 current source to bias the reference stage and a limiting  
3 amplifier coupled to the threshold detector.

1        26. An apparatus comprising:  
2 an output buffer amplifier having positive feedback to  
3 boost gain.

1        27. The apparatus of claim 26, wherein the output  
2 buffer amplifier includes cross-coupled transistors to  
3 provide the positive feedback.

1        28. The apparatus of claim 26, wherein the output  
2 buffer amplifier comprises a level shifter.

1        29. The apparatus of claim 26, wherein the output  
2 buffer amplifier includes a pair of Darlington circuits.